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THE MIAMI CONSERVANCY BULLETIN

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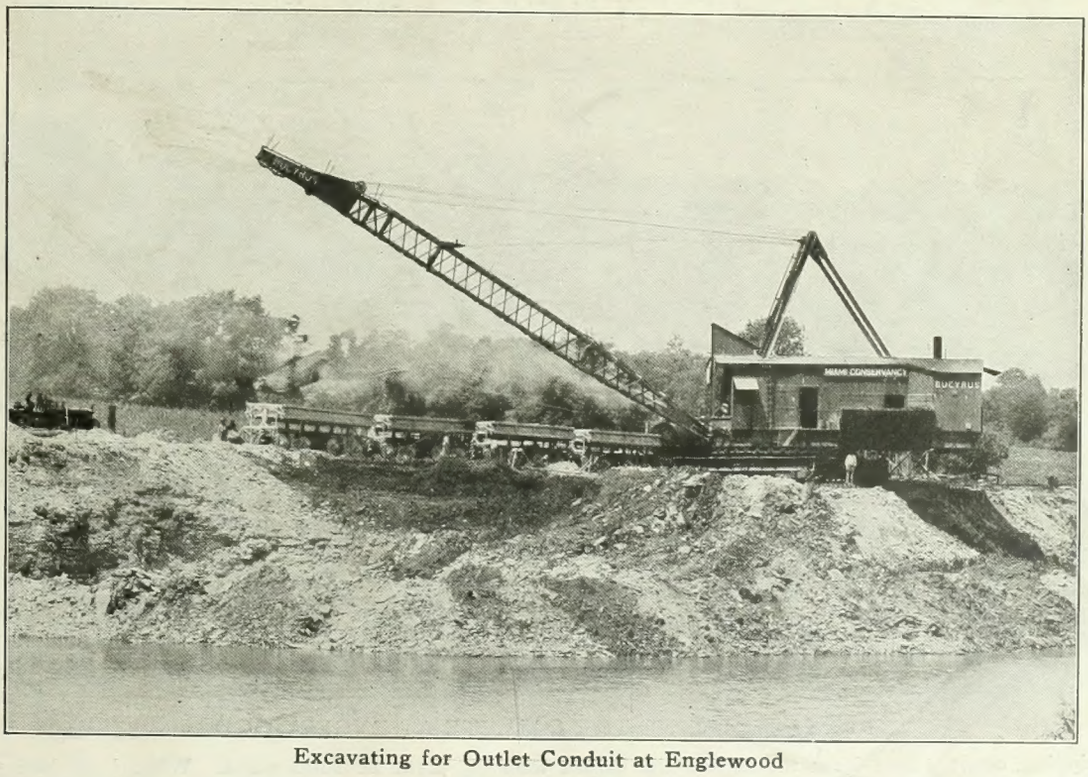
August 1918



Excavating for Outlet Conduit at Englewood

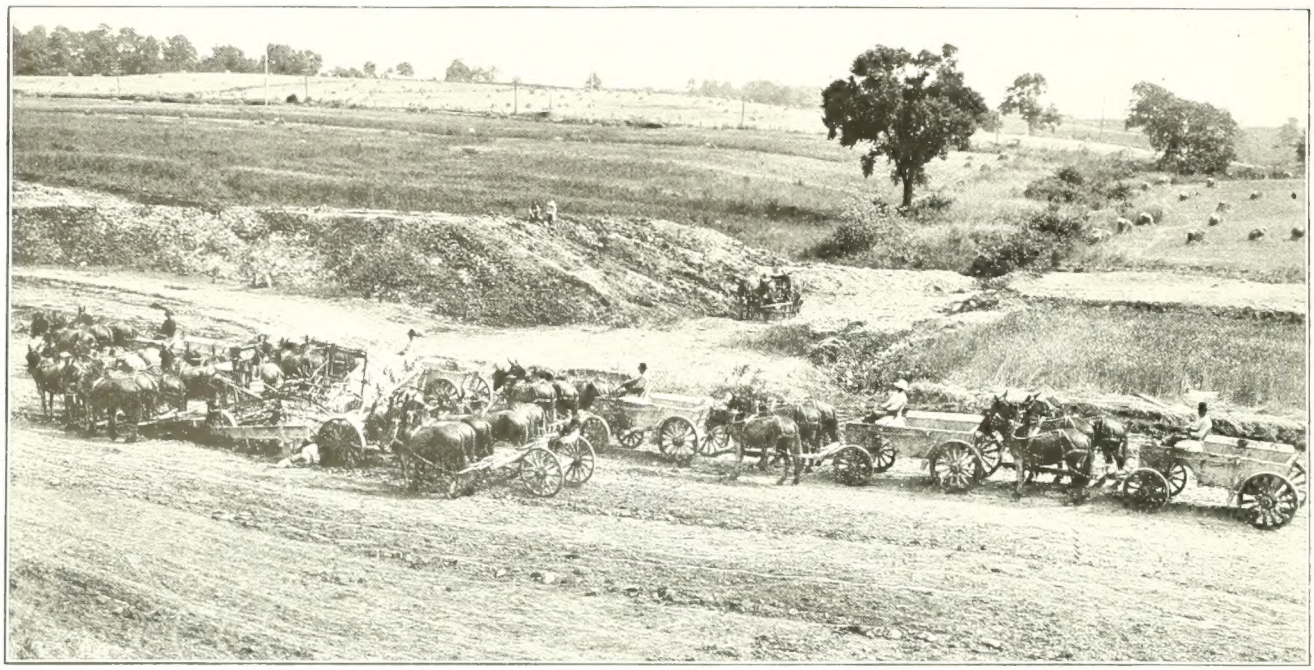


FIG. 1—A STRIPPING OUTFIT

A stripping outfit, such as did that work at Taylorsville and at Englewood. It consists here of an elevator grader and six dump wagons. The elevator grader is the machine at the left. It is operated by sixteen mules, ten in front and six behind, driven by two men. It consists of a large plow fixed to a heavy beam, (shown just in front of the man on the ground) which throws the earth from the furrow onto an inclined belt conveyor. The conveyor carries it up an inclined chute and throws it into a wagon which drives alongside the grader. When one wagon is full the grader pauses, the filled wagon drives on, an empty one drives up to take its place and the grader starts up again. A cascade of dirt thus falls continuously into the wagons, one after the other. The process is very efficient and rapid. From two to four acres a day can be stripped with it.

The outfit here is not engaged in stripping, however, but in railway grading, to which it is likewise adapted. It is shown during a brief pause for adjustment.

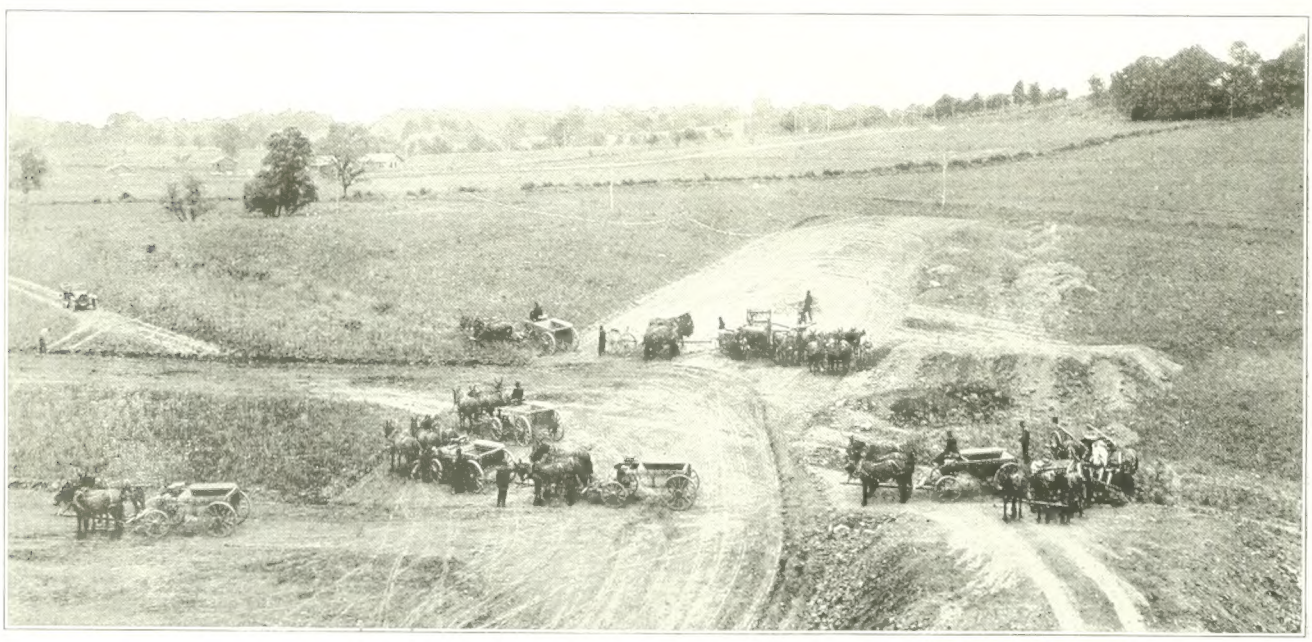


FIG. 2—STRIPPING THE DAMSITE AT ENGLEWOOD

A stripping outfit, taken from the top of the gravel washing plant at Englewood. What look like roads are stripped portions of the dam site. The piles of earth are the stripped material, piled into a "spoil bank." They mark the upstream toe or limit of the dam. The stripping outfit is shown at a moment when it stopped for minor repairs to the "elevating grader" shown at the center of the picture. A similar machine with the wagons in operation is shown just above on this page.

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THE MIAMI CONSERVANCY BULLETIN

PUBLISHED BY THE MIAMI CONSERVANCY DISTRICT

DAYTON, OHIO

Volume 1 August 1918 Number 1

FOREWORD

The **Miami Conservancy Bulletin,** of which the following pages constitute the first issue, is not to be a formal presentation of the progress of the undertaking. Its aim is rather to select those features which are most important, significant, or interesting, and present them in such a way that all may understand what is being done. The project is being carried on purely in the public interest; it is one of wide and vital public concern; and those who have it in charge feel that the public ought to be informed through a regular, responsible, official publication how the work of construction, now beginning, is being carried out. Reports have been made public from time to time, showing the nature and results of the investigations, the general plans, and the design and relation of the various structures, connected with the undertaking. The **Bulletin** is to be considered as in the nature of a more regular, and somewhat more informal, carrying on of these reports. The reports were necessarily rather technical. The **Bulletin,** while also inevitably somewhat so, will aim at a wider audience. It will aim to be what its name implies, a news-bulletin of the progress of the work, presented with such explanations of the technical features as may make them clear to the general reader. It is hoped thus to reach all who are interested in the undertaking with a regular account of the facts.

TABLE OF CONTENTS

	Page
Foreword	3
Building Up an Engineering Organization	4
Progress at the Dams	6
The War Chest	7
Labor Policy of the District	8
Miami Conservancy Honor Roll	9
Anatole Feldman	9
In Memoriam—Alfred Boardman Mayhew ..... Chas. H. Paul	10
Some Figures on Men and Equipment	11
The Dam ..... Anatole Feldman	11
The Camps	12
Seen and Heard on the Job	14
Rupe's Iceless Refrigerator. Fast Section Line Survey. Railway Relocation.	
Remarkable First Aid. Moving Locomotives to Germantown Damsite.	

The Miami Conservancy Bulletin is published on the first day of every month. Matter for publication must be in the hands of the Editor by the fifteenth of the month preceding. Address Miami Conservancy Bulletin, Dayton, Ohio.

Building Up an Engineering Organization

How the Efficiency of a Permanent Industrial Organization
Was Secured for the Miami Valley Project.

The engineering organization for a great project like that of the Miami Valley Flood Control, while vastly more complex, and taking far longer to mature, is in certain ways like a football team. It is so in its temporary character. It is gotten together to do a particular job. When that job is done, it dissolves. In the one case the job is the winning of a game; in the other it is to build some great structure or connected series of structures, and in each case a considerable course of preliminary work together is necessary to the efficient performance of the task in hand.

In any engineering project, and especially in such a one as flood prevention for the Miami Valley, on account of the unusually vital interests at stake, a great amount of preliminary investigation and a careful design of the structures are necessary. This work is done by the engineering organization almost alone, at comparatively small cost. The heavy expense comes later, when the plans prepared are to be carried out in actual construction. The gain in perfecting efficient organization during the earlier stages, to be applied later, is clear. It not only lessens cost and increases speed, but betters the finished work, since the same men who made the plans will carry them out.

It seems obvious enough; yet it was not carried into effect without a certain opposition. It meant a more than ordinarily heavy force on investigation and design; heavier than to some seemed necessary. Fortunately the Directors of the District, the men who had the final decision, had had a good deal of experience in large affairs, and were able to take the broader view. They saw the point and from the beginning they gave Mr. Morgan their hearty backing in the carrying out of his idea.

The amount of work involved in building the organization is something which few even among its members have adequately conceived. The desire was to get the very best men available, and no effort was shirked in the endeavor to do so. As personality in the individual is the secret of success, so is personnel in the organization; harmonious personnel. Not only the best men must be found, but the best men who would **fit**; men who would cooperate. The extreme individualist has no place in such an organization. He can't subordinate himself.

And after you have found your man, there is still the problem of getting him. When great engineering works are approaching completion, the better men engaged in them are on the lookout for fresh places and it is then that they can be best secured. Thus when the work on some of the great dams in the Catskills, the sources of New York's water supply, was finishing, as far back as 1914, Mr. Morgan took the occasion to secure the services of the man who is now in charge of the work of the Englewood dam.

Similarly, and at about the same time, the services of Mr. Kimball were secured. It was clear from the beginning that when the work of channel improvement through Dayton, Hamilton and the other large river towns came to be carried out, the expensive sewer and water systems in these cities, where they cross the river, would be subject to serious dislocation. Fortunately, just at this time, the extensive sewerage improvement in the city of Louisville, Ky., a $4,000,000 project, was being brought to an end, and the services of Mr. Kimball, who had had virtual charge of that work, became available and he was engaged. Thus it was possible to build up, in the years that have since ensued, during the study and planning for channel improvement, the same engineering organization which is now supervising the actual work. These men are mentioned simply as instances. Many more, equally pertinent, might be noted.

FIG. 3—RAILWAY EXCAVATION AT GERMANTOWN

A Marion caterpillar dragline, temporarily transformed into a steam shovel. As soon as this railroad grade is completed the dipper will be removed and the machine will again operate as a dragline.

But more than the heads of the various departments of the work were needed. Assistants were also required; and assistants to these—a large body of men. To get them search was made in many directions and by various means. Advertisements were inserted in the engineering periodicals. Letters were written to the engineering departments of the various universities and technical schools, making inquiry as to the promising graduates who might be available. Application was made to the heads of engineering projects which were approaching completion and likely soon to release desirable men. Also, but to a less extent than any of the means already outlined, engineering employment agencies were used.

From all these sources a large number of prospective employees came to the attention of the

engineering office of the District, embracing men of many kinds. In the years between 1914-1916 over three thousand such prospects were considered. These were classified and systematically arranged. Applicants were asked to answer a systematic set of questions, designed to cover their experience and their special qualifications for the work desired. What may be called the design of the organization, and the qualifications of the men who were to become the elements of that design, received the same thorough-going attention as was given to the design of the conduits, the spillways, or the system of hydraulic fill for the various dams.

These thousands of applicants, then, were studied, sorted, and the best prospects were picked out. With these selected men personal interviews were arranged. Sometimes these took place in Dayton; sometimes elsewhere. In important cases many men were thus seen in order that only the best might be retained. On one trip, Mr. Morgan interviewed about fifty men, from whom three were ultimately selected. At this same time over two thousand applications were examined, to obtain six men. Nothing was left undone in the effort to make sure that in this, one of the most important tasks which the Chief Engineer had to perform, the surest possible foundations should be laid.

It must be emphasized that this process cannot properly be called a sifting of the wheat from the

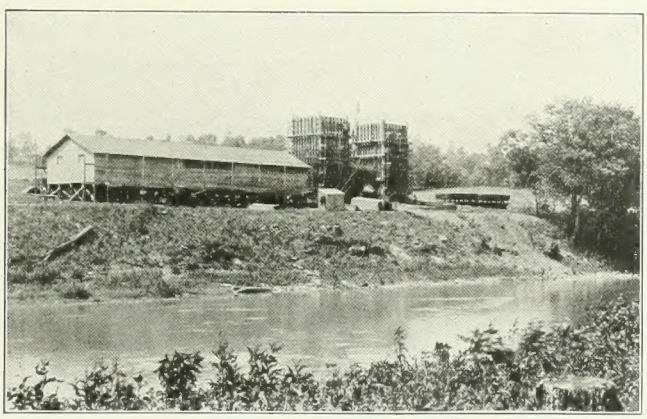


FIG. 4—THE GRAVEL WASHING PLANT AT ENGLEWOOD

A view of the cement house (at the left) and the gravel washing plant just beyond it, taken May 25 from the opposite side of the Stillwater River. What looks like the muzzle of a "Big Bertha," poking out of the base of the gravel washer, is the barrel and mouth of a concrete mixer.

chaff. Unquestionably hundreds of excellent men were among those rejected. It was rather a process of selecting the best, and among these, those who would **fit**; keeping in mind always three criterions of judgment, by which all men for responsible positions were to be weighed;—original power in engineering research and in the designing of engineering structures; ability to superintend the actual construction of the completed design; and finally, fitness for teamwork, the ability to sink the interest of the individual in that of the job.

The results of this foresight have been gratifying. Mistakes of course have been made. Not all the men selected have remained, but aside from those who have enlisted for military service, approximately nine in ten have done so, and have proved to be what was hoped of them. With a few exceptions, all the engineers now in responsible positions on construction have been engaged in the research work and in the design of the structures which they now have in charge to build. And in these exceptional cases the men finally selected are such as have on other work held responsible places under either the Chief Engineer or the Assistant Chief, and are thus personally tested men.

A civil engineer, by the nature of his profession, is more or less of an Ishmaelite, a wanderer without fixed abode. It follows that when a large number of civil engineers get together, as they necessarily do on any great undertaking such as the Miami Valley Flood Control, they gather from many and distant corners of the earth. There are on the project men of many different countries, including the United States, Holland, Canada, Norway, England, Ireland, Austria, and China. They come from twenty-six states of the union. They represent forty-one different universities, colleges and technical schools. Their work has carried them into many countries other than those mentioned. One has been in South America, where he built the highest railway in the world, across the Andes Mountains. Another has worked in the East Indies. There are men who have designed and built dams and tunnels and pipe lines in Arizona deserts; and others who have built dams and tunnels among the New England hills. There is the man who assisted in designing the spillway of the great Gatun dam, on the Panama Canal. The same man had a vital part in the designing of the largest dam in the world, the Kensico dam at Valhalla, N. Y. There is a man who has designed and built drainage systems in the Phillippine Islands, for the United States Government. And there is the man who designed and built the highest dam in the world, at Arrowrock, Idaho.

These things appeal to the imagination. They also appeal to the solid sense. These men were not picked out because they had gone far and wide on engineering projects, great and small, but because of their special fitness in each case for the particular job in hand. The geographical facts quoted simply help to visualize the breadth of experience which has been drawn upon, and in a degree the width and breadth of the net which has been thrown to get the desired men. The significant thing is that all these men, coming from such wide sources, and with such rich and varied experiences, have been gathered together here in Dayton, and all that wealth of education and experience and resource fused and welded into one harmoniously interlinked organization, to the end that the Miami Valley may be free for all time from any such disaster as overwhelmed it five years ago.

The Big Dayton Dragline Excavates 10,000 Cu. Yds. Per Week.

The big dragline working between Herman Avenue Bridge and the mouth of Mad River in Dayton had moved 60,000 cubic yards up to July 17. The dragline started this work on June 4. This is an average of about 10,000 cubic yards per week.

Progress at the Dams

Much Preparatory Work Has Been Done in Clearing, Stripping, Cut-Off Trenching, Conduit Excavation and Erecting Construction Plant. Embankment Not Yet Started.

The first operation in the construction of a dam is the cutting of the trees and the grubbing of the stumps on the damsite, the two usually classed together as "clearing and grubbing." On the river and creek bottoms this operation is practically complete at all the dams, and in most cases the slopes of the valley are also cleared. Taken as a whole, the clearing approaches completion.

Following the clearing comes the stripping; that is, the removal of the top soil and humus from the damsite, and the piling it in "spoil banks" along the upstream and downstream edges or toes, where it will be available after the dam is completed to spread again over the surface as a top dressing to be grassed. An additional and more urgent reason for stripping the top soil is that it always contains more or less material not fit for incorporation into the completed structure. The dams of the district are all earthen dams, but the earth they are made of is all to be carefully selected, and the soil on which they rest must be equally good.

On the river and creek bottoms, at all the dams, the stripping is completed except for minor trimmings. On the valley slopes, however, it still remains in most cases to be done. At Englewood it is nearing completion over the entire damsite.

In most cases this work has been done with plows and wheeled scrapers. At Englewood and Taylorsville it has been speeded up by the use of dump wagons and an "elevator grader." This outfit is shown, as it appears during a pause for repairs, in figure 2. A similar outfit, used for railway excavation, appears in figure 1.

Following the stripping comes generally the digging of the "cut-off trench." This is simply a deep ditch running along the longitudinal center line of the dam. It is called a "cut-off trench" because later it will be filled with clay tamped firmly in to cut off any leakage of water through the soil under the dam. "Sheet piling"—in effect wide, flat bars of steel driven with their edges interlocked in the bottom of the cut-off trench, forming a metallic wall—will be used where necessary, to carry this protection against leakage still deeper.

At three of the dams the cut-off trench is not yet started. At Taylorsville it has been dug almost across the valley floor. (See figure 5). The digging was done with a Bucyrus "dragline," shown at work in figure 6.

At Huffman the excavation of the cut-off trench is fairly well begun.

At the base of every dam, founded on the native rock, will be built a conduit to carry the water of the stream as it flows under ordinary conditions. This is one of the first pieces of construction to be undertaken, in order that a channel for the water may be provided, not only after the dam is built but while it is building. At Huffman it will occupy the

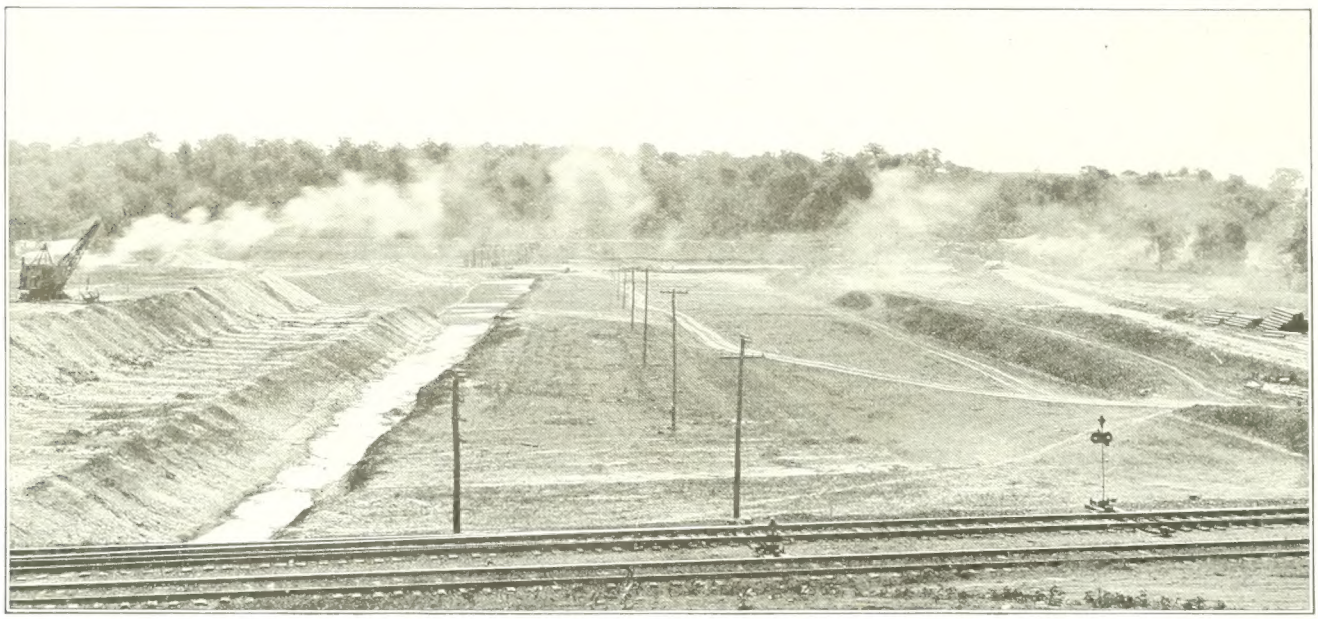


FIG 5—THE CUT-OFF TRENCH AT TAYLORSVILLE

The same scene as in figure 6, as it appears just one month later. The cut-off trench is now completed nearly to the river. The stripping of the river bottom is finished. The left hand trestle is now across the river. The new pole line down the center brings electric power from Dayton for the operation of the big dragline and other machinery. A locomotive and train are seen on the construction track to the right.

present river channel. In this case a short canal or "diversion channel" must be dug to carry the water while the conduit is building. The excavation of this canal at Huffman is just beginning. At Englewood and Lockington the excavation for the conduit itself has begun and is being carried forward by big "draglines," that at Englewood being shown in operation in figure 8. At the other three dams the digging for the conduit is not yet begun.

The digging just referred to is for the foundations of the conduits. These structures themselves will be built of concrete, as will the spillways and various other features of the dams. To make the concrete some two hundred thousand cubic yards of gravel will be necessary. This will be obtained in most cases from the river bed or valley near by. Before being used it must be washed clean of clay and earth, and run through screens of various sizes. Gravel washing plants for this purpose are being erected at all the dams, with accessory cement houses and concrete mixers. Several of these plants are nearing completion. The one at Englewood is shown in figure 4.

Besides the gravel washers, much other plant and machinery necessary to the construction of the dams has been assembled or built; such as railway tracks, locomotives, dump cars, excavators, steam shovels, cranes, derricks, trestles, etc. A number of these appear in the various pictures. The matter of equipment, however, must be reserved for a future issue of the Bulletin.

It will be clear, from a consideration of what has been said, that while an immense amount of work has been done, the construction of the dams themselves is hardly more than begun.

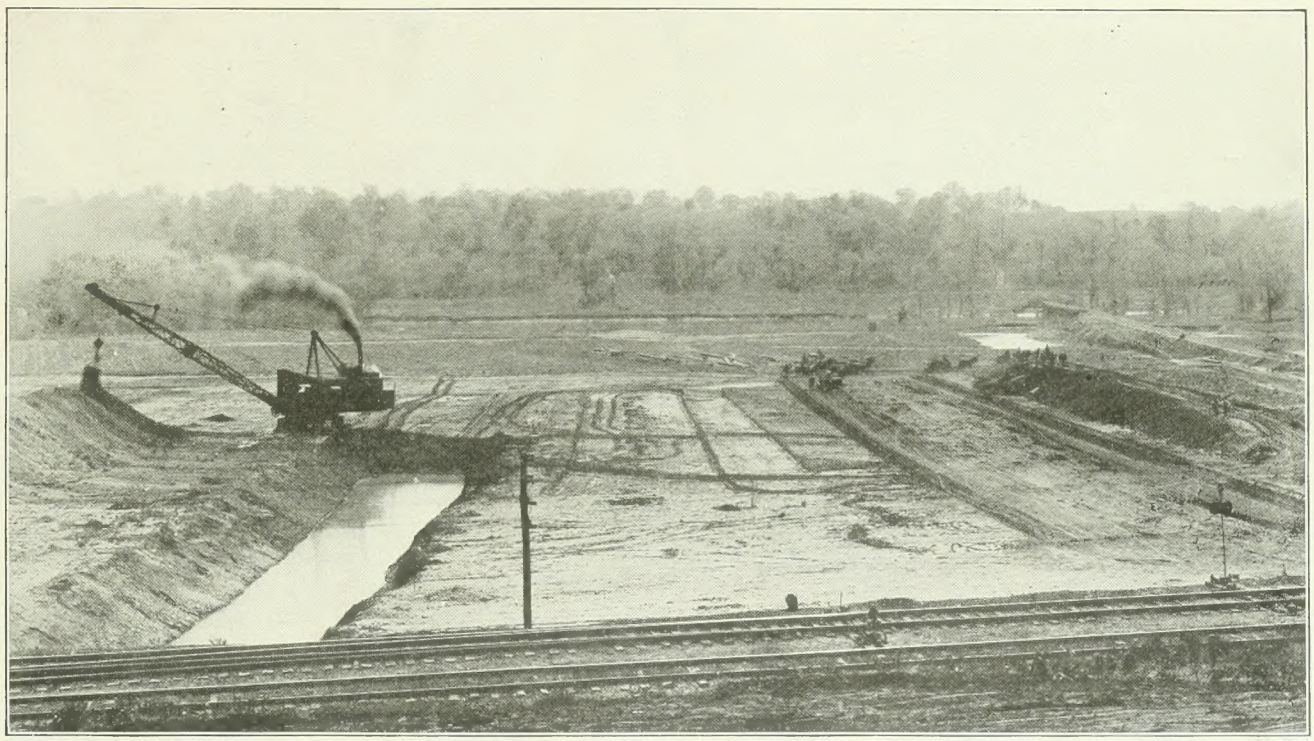


FIG. 6—EXCAVATING CUT-OFF TRENCH AT TAYLORSVILLE

Taken May 16 from a point near the center line of the dam and a little west of the B. & O. R. R. tracks. The pool at the left occupies the cut-off trench, which is dug to full depth for a part of its length. The big dragline is seen here at its task, dropping a bucket of earth on the bank which it has just scooped from the trench. The bank will form part of the dam when built. The first bank at the right is a "spoil bank" of stripped top soil, which the teams are taking from the original surface by means of the elevator grader and dump wagon outfit spoken of earlier. This bank marks the downstream toe of the dam. The pile driver is seen at the left in the distance, beginning the upper trestle. The lower trestle appears at the right, connecting with the temporary construction track as shown.

The War Chest

The organization of the District was gladly put at the service of the Montgomery County War Chest Committee. A committee headed by C. W. Porter-Shirley met at the headquarters office in Dayton on May 24 to outline the work. Meetings were held at the Dayton office and at the various camps. These meetings, attended by almost all the employees of the District, were addressed by various speakers and resulted in a total contribution to the War Chest of $13,323.60, distributed as follows:

Treasurer's, Tax, Audit, and Legal payrolls	$ 2,880.60
Headquarters Office payroll	1,909.25
Dayton Shop payroll	661.75
Englewood	2,481.00
Germantown	1,286.00
Taylorsville	1,634.00
Dayton local	607.20
Huffman	1,427.00
Feature No. 1001	436.80
Total	$13,323.60

These figures include Montgomery County only.

Labor Policy of the District

Right of Collective Bargaining Recognized. No Discrimination For or Against Non-Union Men.

At a recent meeting of the Board of Directors, the following was adopted as a statement of the Labor Policy of the Miami Conservancy District. It is the aim of the Board to secure uniform treatment for all labor employed, and all division engineers, superintendents and foremen are requested to govern themselves by the spirit as well as the letter of this policy. In return for fair and courteous treatment the workmen of the District are asked to give to the job their interest and the best work that is in them. In a great task like this, where the public is paying the cost, there is no room for slackers.

All labor shall have equally fair and impartial treatment. There shall be no discrimination in treatment against unskilled labor, or against any other class of labor, simply because it is not in a position to enforce its demands, but exactly the same treatment shall be given to all, except that higher skill, or skill in greater demand, shall be paid higher wages, and lower skill, or skill in less demand, shall be paid lower wages. A man's character and workmanship shall be the sole basis on which his employment shall rest.

The right of workers to organize in trade unions and to bargain collectively through chosen representatives is recognised and affirmed. This right will not be denied, abridged, or interfered with in any manner whatsoever by

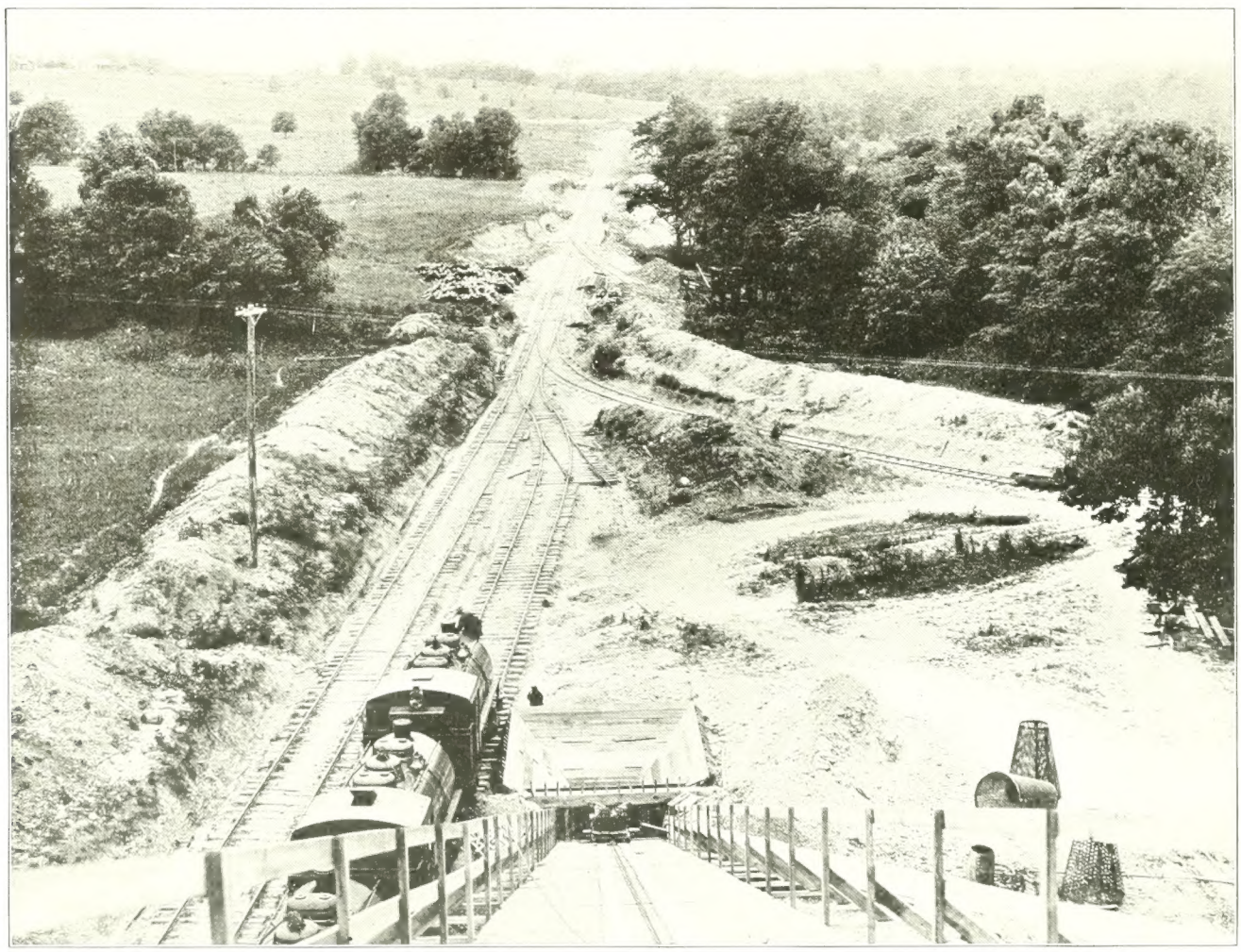


FIG. 7—LOOKING NORTHWEST FROM THE TOP OF THE GRAVEL WASHING PLANT AT ENGLEWOOD

Looking northwest parallel with the river up the construction track which leads over to the Dayton, Toledo & Chicago R. R. at Union. It was built to bring in the machinery and materials to be used in the construction of the dam—locomotives, cars, excavators, steam shovels, timbers, lumber, piling, etc. The track at the right leads to a trestle built to carry it across the river. Three construction locomotives appear in the foreground. The inclined platform leads to the top of the gravel washing plant, about sixty feet in the air, from which point the picture was taken. The hopper at its foot is to receive the gravel dumped from cars which will run alongside the hopper on a standard gage track. From the hopper the gravel will be carried up the incline on a conveyor belt to be washed and screened, and then distributed to the bins. Taken June 22.

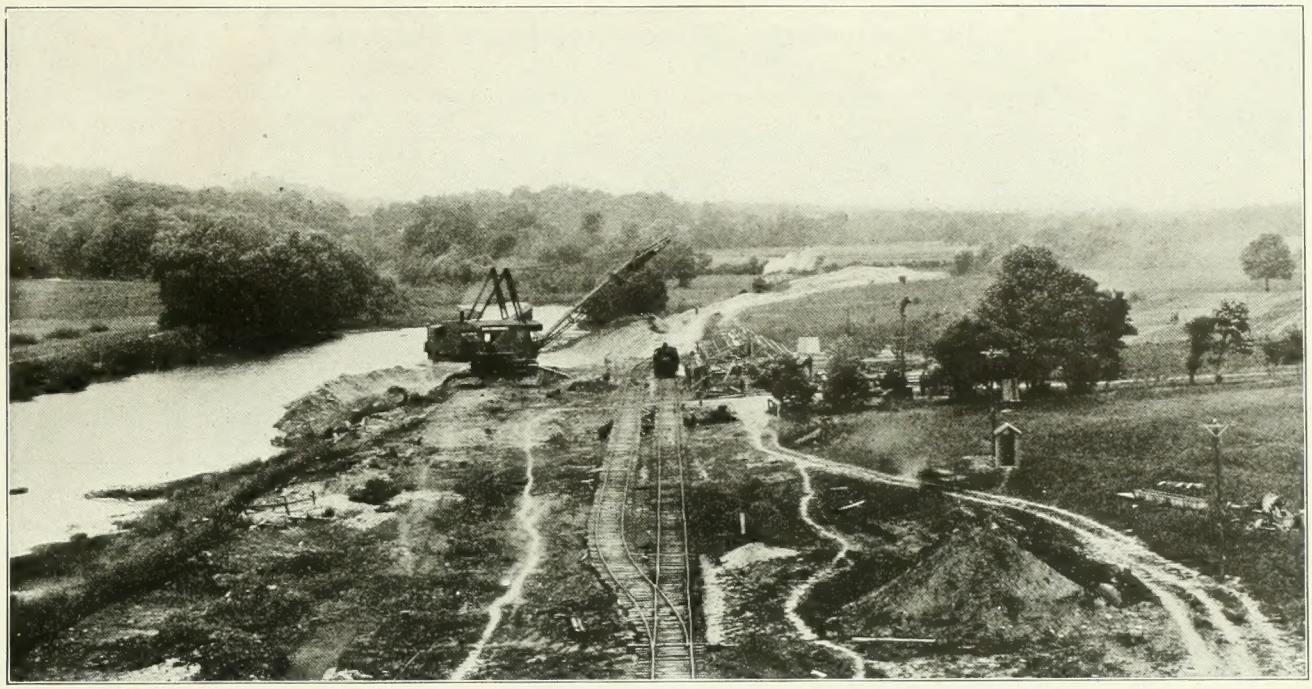


FIG. 8—LOOKING SOUTHEAST FROM THE TOP OF THE GRAVEL WASHING PLANT AT ENGLEWOOD

The big machine is the Class 24 Bucyrus dragline excavator, digging the foundation for the downstream end of the concrete conduit which will carry the water of the river after the dam is built. The excavator bucket can be dimly seen hanging from the end of the long arm, or "boom," in the act of dumping its load of clay and rock into a dump car which is hidden by the locomotive. A second locomotive can be seen on the "dump" or "spoil bank" in the distance, with the cars discharging their load. The excavator loads one train while the other unloads.

The pole line at the right brings electric power from Dayton for the operation of machinery. The skeleton of a building beside the locomotive is a carpenter and blacksmith shop in process of erection. It will take its power from the pole line. Taken June 22.

the officers or representatives of the District; and employees shall not be discharged for membership in trade unions, nor for legitimate trade union activities.

No man shall be denied employment by the district and no employee of the district shall be discharged because he does not belong to a trade union. Employees shall not use coercive measures of any kind to induce persons to join any labor organization nor to induce the officers or representatives of the district to deal therewith.

The maximum progress of the flood prevention work shall be maintained, and methods of work and operations which operate to delay or limit progress, or which have a tendency to artificially increase the cost of the work, will not be countenanced.

Eight hours will constitute a day's work, and six days' work will constitute a week's work. Overtime will be paid for at the rate of 1½ times the ordinary rate for all time over eight hours on week days, and double time for all the time worked on Sundays and holidays; holidays being Memorial Day, Independence Day, Labor Day, Thanksgiving, Christmas and New Year's. Eight hours will constitute a day's work on Saturday, but no employee on an hourly rate of pay will be required to work on Saturday afternoon. In case the regular hours of the night shift on Saturday night extend beyond midnight, such time will not be counted as Sunday work. Provisions for overtime do not apply to employees on monthly salary.

Working time will be counted on the job and no time will be paid for which is spent in traveling to or from a job, and no transportation for such traveling will be allowed, except in special cases where a man is sent away from the location of his regular work. Accommodations for all labor are provided on the job at reasonable rates, and anyone living away from the job does so for his own convenience and with the clear understanding that he must be governed by this regulation.

The men will be paid on each Saturday, for the work done up to and including the previous Tuesday.

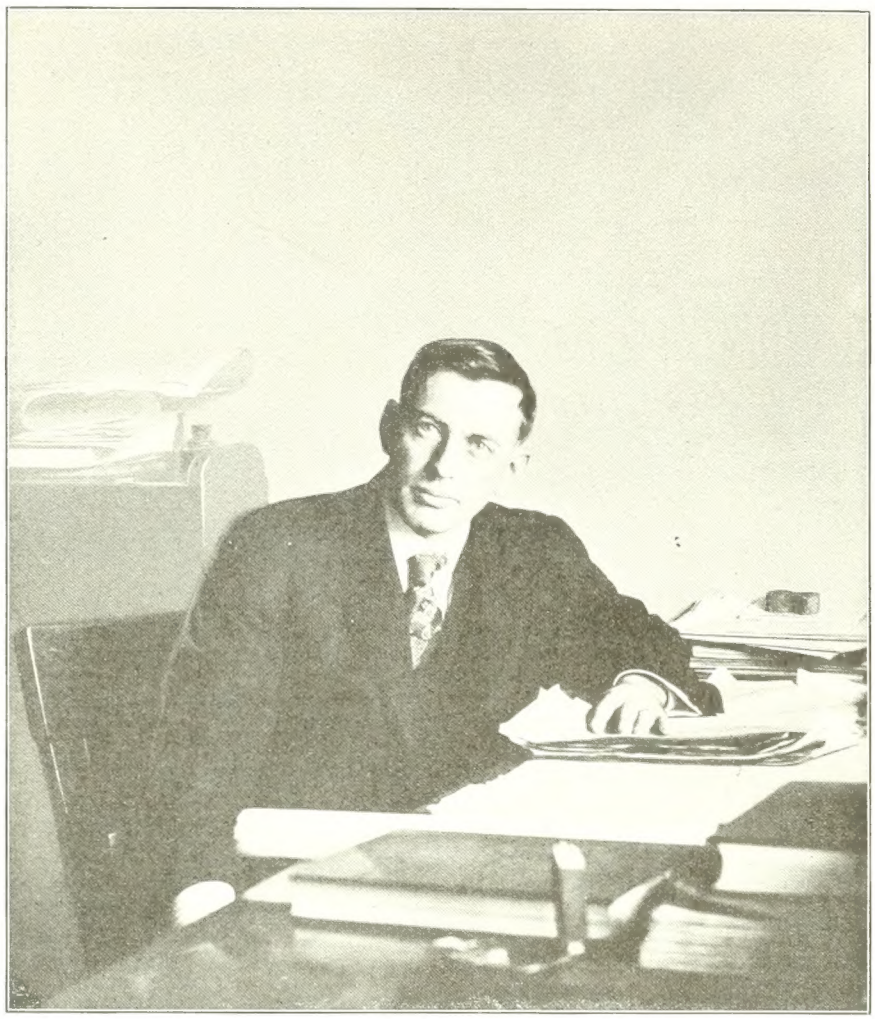
The Honor Roll

The Honor Roll of the men who have gone from the Miami Flood Control work into the service of the United States Government in its prosecution of the war will be published next month, when it is hoped that a complete list will be available. Most of the names of those going from the office and the engineering forces are on file, but a number of men have gone from other payrolls whose names have not been turned in. We shall be very glad of information regarding any of these. Extensions of the Roll will be published from time to time. As far as possible, the Bulletin will be sent to all of our men who are in the service. We shall be pleased to hear from them, and to "pass around" letters of interest which they may send.

Anatole Feldman

We have been at considerable pains to find the author of the poem, "The Dam," which we republish in this issue from the Dayton Daily News, in which it appeared some days ago. So far, however, we have been unable to do so. We like the poem. It has the virtues of simplicity, strength, vividness, and sincerity. It answers the demand of the great Russian, Tolstoi, that poetry should be the natural by-product of the man at his work. We hope to hear from Mr. Feldman again.

In Memoriam—Alfred Boardman Mayhew



Alfred Boardman Mayhew was born at Heath, Massachusetts, September 3, 1878. He graduated from Tufts College in 1904 with a degree of B. S. in Civil Engineering.

His earliest engineering work was in New England on the construction of two dams for power development, one at Gavins Fall, New Hampshire, and one at Dorchester, Massachusetts.

In June, 1905, he entered the employ of the United States Reclamation Service and occupied various responsible positions connected with the design and construction of large irrigation projects in the West, principally the Minidoka and the Boise projects in the State of Idaho. He was Resident Engineer on the construction of several important sections of main canal, including diversion dams, bridges and other large structures providing for cross drainage, railroad crossings, lateral outlets, etc.

When the construction of the Arrowrock Dam (the highest dam in the world) was authorized, Mr. Mayhew was selected as principal engineering assistant to the construction engineer and had direct charge of field engineering and designs. He was personally responsible for many of the details of design of that dam and related structures, and was closely identified with the construction work until it was nearly finished.

In November, 1914, Mr. Mayhew was given a furlough by the Reclamation Service in order that he might accept a position with The Morgan Engineering Company at Dayton, Ohio, on studies and plans for flood prevention works in the Miami Valley. He continued on that work as an employee of The Miami Conservancy District after the formation of the District under the Conservancy Act of Ohio. He took a prominent part in the preparation of the designs, specifications, and estimates for the whole project and when construction started he was given charge of the Germantown dam as Division Engineer. It was while directing the work of raising a suspension bridge above the reach of flood waters, at this dam, that Mr. Mayhew was thrown into the river and drowned, on May 12, 1918. Just a short time before the accident to himself, Mr. May-

hew had posted notices at both ends of the bridge warning the public to keep off, as it was dangerous.

Mr. Mayhew's fine personality, coupled with his well balanced capabilities as an engineer, gained for him the respect and confidence of all with whom he associated. He was not only a good engineer but also a good citizen, and took a lively interest in the affairs of the day.

Mr. Mayhew was married on September 14, 1911, to Miss Maude O. Greene, of Princeton, Illinois, who survives him.

He was elected to Associate Membership in the American Society of Civil Engineers in November, 1909, and became a member in January 1916.

Charles H. Paul.

The Dam

You men,
Toiling by day,
And making the stars pale
With your fires at night;
You men
With your unearthly cries and grunts,
Who work with brain and brawn,
While whistles shriek and hammers
trip
That this thing should be built;—
For what do you strive?

Is it for your so much per hour
That you may eat and live,
And that you may clothe your families?
Or do you see nothing
But your spell of rest
After the day's grueling ardor?

Ah,—
Canst see
The flood's sweeping water
Checked by this thing you build?
Canst see the torrent's flood,
Eager to destroy,
Splintered to spray
Against this great base?
Canst feel
The bigness of your task?
The lives,
The infinite lives saved
By your toiling?

Anatole Feldman,
Laborer, Englewood Dam.

Some Figures on Men and Equipment

The following are a few statistics regarding men and equipment, showing something as to the extent of present operations.

There are now on the payroll 1681 men, distributed as follows:

Payroll		Total No. of men on Payroll
No. 1	Germantown	265
No. 2	Englewood	313
No. 3	Lockington	118
No. 4	Taylorsville	217
No. 5	Huffman	212
No. 42	Dayton	48
No. 58	Hamilton	87
No. 1001	Railroad Relocation	146
No. 200	Mess Gardens	8
No. 200	Shops	146
No. 200	Headquarters	87
	Treasurers'	34
	TOTAL	1681

These men represent forty-five different occupations. They include accountants, chauffeurs, clerks, stewards, cooks, bakers, draftsmen, electricians, civil and mechanical engineers, inspectors, laborers, steam engineers, dragline and steam shovel runners, blacksmiths, boilermakers, machinists, millwrights, plumbers, carpenters, painters, riggers, rock drill men, brakemen, concrete men, hostlers, stenographers, time-keepers, doctors, and watchmen.

There have been purchased and delivered to the various dams up to date, ready for operation, 18 construction locomotives. Thirteen of these operate by steam and five by gasoline. A number are already at work.

These locomotives will be used with 80 dump cars, carrying rock and earth for the construction work. The necessary railway track has required the purchase of 1300 tons of steel rails and more than 30,000 ties. Several miles of track have already been laid.

To carry men and materials back and forth from the warehouse and headquarters in Dayton to the various points where construction is going on, the District maintains at the Dayton garage 54 automobiles of various types, including 11 Dodge, Ford, and Hudson touring cars, 13 Ford light delivery trucks, 4 Ford runabouts, 9 Ford one-ton trucks, 5 Ford depot wagons, 7 Pierce-Arrow five-ton trucks, and 5 Pierce-Arrow two-ton trucks. These machines consume on the average about 170 gallons of gasoline per day.

There are on the work seventeen dragline excavators for digging earth and rock, varying in size from the little fellows of thirty or forty tons weight to the big machines like the one working along the river in Dayton, which carries fifty tons of ballast alone, to balance its hundred-and-twenty-five foot steel boom. To operate these draglines, and the various cranes and derricks on the work, about fifty miles of steel cable have been ordered, some four miles of which have been received.

For the concrete in the various structures about 300,000 barrels of cement have been ordered, of which about 10,000 barrels have been received and stored. The reinforcing concrete steel received to date amounts to 966,000 lbs.

For the electric lines bringing light and power to the various camps 25 miles of wire have been used, and 8 miles of galvanized cable wire.

The Camps

An Attractive Suburban Village Erected at Each of the Dams, with Modern Sanitation and Conveniences. The Houses To Be Sold After Construction Is Completed.

In the carrying out of a large construction project, the labor question is of prime importance. The problem of getting men to do your work, and of keeping them after you have got them, is one of the biggest single questions that faces the employer. Old conditions are rapidly passing; new standards must be met. Among these new conditions, that of adequate housing looms large. The days of tents and shacks, of unsightly, unsanitary, inconvenient camps, are gone or rapidly going. In conformity with this change, the Miami conservancy District is endeavoring to provide first class accommodations for its working force. At each of the five dams of the District, it has built a modern camp for its men.

At the present stage of the work, in the vicinity of any of the dams, these camps are the most striking objects in the landscape. "Camp" is scarcely the word for them. They are rather suburban villages, with all the modern conveniences, and in most cases the facility of access to nearby cities by means

FIG. 9. A NO. 2 COTTAGE AT HUFFMAN

A one-story house, 24 by 26 feet in size and renting for $16 per month.

of railways and inter-urban lines, which such villages usually have. It is expected, indeed, that they will eventually become such villages; that men will occupy them who will work in the cities, or at gardening; or who will make of them summer homes. Several of them lie in what are really picturesque and beautiful settings, such as might well attract the growing number of people who prefer country homes. The camp at Germantown is shown on page 10. A plan of the camp is shown in figure 11.

The cottages, in the main, are of the low, broad-roofed, one-story type that fits so well with a country setting. Simple in design and inexpensive in construction, they are yet architecturally well proportioned and conveniently planned for family use. There are five different designs, numbered for identification, beginning with the "Number One," the smallest and least expensive, and running up to the largest, the "Number Five." A table below gives the size, number of rooms, and the rental for each.

Views of the No. 1 and No. 2 cottages are shown in Figs. 12 and 9 and a plan of the No. 1 in Fig. 13.

Style of Cottage.....	No. 1	No. 2	No. 3	No. 4	No. 5
Number of Rooms	3	4	4	5	5
Size in Feet	24x24	24x26	18x26	24x32	26x34
			Two-Story		
Rental per Month	$15	$16	$16	$19	$21

That these accommodations will be welcomed by the men is proved by the demand for them at the present time, several weeks before they will be ready for occupancy. A hundred and twenty-five cottages have been built or are in process of building. Most of these have been already rented. (The number given does not include messhalls, first-aid hospitals, stores, etc., but only dwellings.) In popularity the designs seem to be about equal, judging by the demand. The lowest in price naturally leads. Most of the renters have so far been foremen, superintendents, or specially skilled workers. A number of the cottages, however, will be occupied by laborers.

The cottages described are intended for men with families. For single men bunkhouses are provided. These are of two types, one providing separate sleeping rooms, the other bunking the men in one large common chamber. The first type is built in various sizes, accommodating eight, twelve, or twenty-four men. The general arrangement is the same in all of these. Each house has a porch, a sitting room, a wash and toilet room with shower baths, and sleeping rooms accommodating either two or four men each. A man may have a room to himself by paying a higher rate. Each bunk has a window at its head for ventilation in summer. A floor grating the entire length of the bunkhouse, with steam pipes below, provides heat when necessary. The occupants will usually eat at the big camp messhall. These messhalls are already in use at all the dams. A picture of a 12-man bunkhouse is shown in figure 14.

As to cost, a bunkhouse man occupying a two-man sleeping room with a mate pays 50 cents per

FIG. 10. THE WAR GARDEN AT HUFFMAN

The water and sewer trench runs diagonally across it, not yet "back-filled." The garden is some five or six acres in extent. Potatoes and garden truck of various kinds will be cultivated here during the season. Similar gardens are in at all the camps.

week rental. A man can get a small room alone for 75 cents; or a larger one for $1.00 per week. The

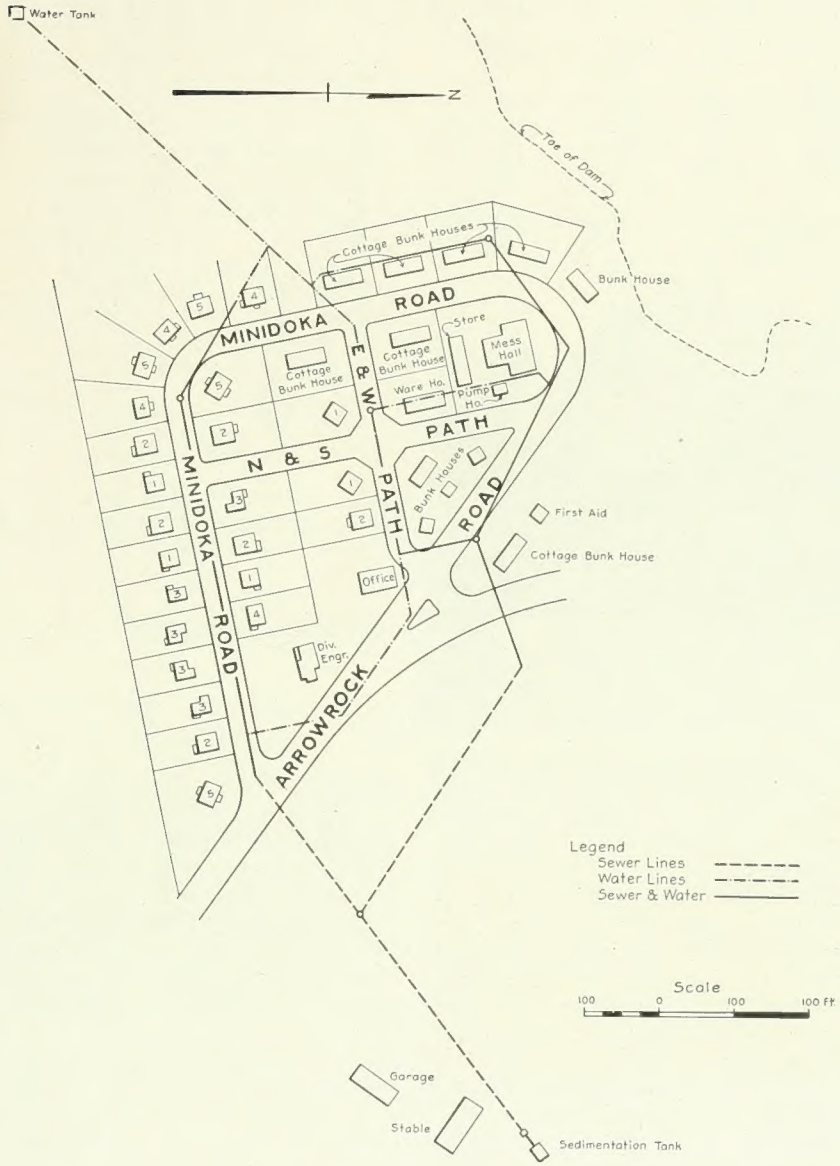


FIG. 11—PLAN OF GERMANTOWN CAMP

The dashed lines are sewer mains. The dash-and-dotted lines are water mains. Where the lines become solid, both mains are in the same trench. Note how near the northwest corner of the camp comes to the foot of the completed dam. The numbers on the houses denote the different designs.

four-man sleeping rooms also rent for 50 cents per bunk. Cots, springs, mattresses and blankets are provided with the rooms. Meals at the camp mess cost 35 cents each.

In the second type of bunkhouse, the one providing one large sleeping chamber for all the occupants, arrangements are made so that the men can do their own cooking, stoves being provided free for this purpose. In this case, cots, springs and mattresses only are furnished by the District. No rental is charged for bunks in these houses.

A third variation is the cottage bunkhouse, accommodating five men who board with a family which occupies the same house. The arrangement here is such that the domestic life of the family can be kept well separated from the sleeping chambers and living room of the men.

All of these types of bunkhouses are in demand; indeed, houses of all the designs provided—cottages, bunkhouses, and cottage-bunkhouses, are being occupied as fast as they are ready for use.

As the pictures indicate, each camp has a water system. Pure water, obtained from drilled wells, is pumped to a tank on the higher ground and distributed through pipes to every cottage.

Each camp will also have a sewerage system, discharging into a combination septic and sedimentation tank, (a modification of the Imhoff design) and thence, where necessary, through a sand filter bed to the adjacent stream. With pure water, sanitary sewerage, and watchful camp sanitation, the health of the men should be maintained at a high level. Health is money, to employer and employee alike.

A comparative table, giving the percentage of completion of the water system, the sewer system, and the houses, at the various camps is shown below. House connections to sewer and water mains are not included.

Camp	Houses	Water System	Sewer System	Date of Report
Germantown	80%	40%	100%	July 1
Englewood	73%	60%	70%	July 1
Lockington	90%	100%	100%	July 18
Taylorsville	80%	100%	100%	July 11
Huffman	92%	65%	78%	July 1

FIG. 12—A NO. 1 COTTAGE AT HUFFMAN

A one-story structure, 24 by 24 feet in size and renting for $13 per month.

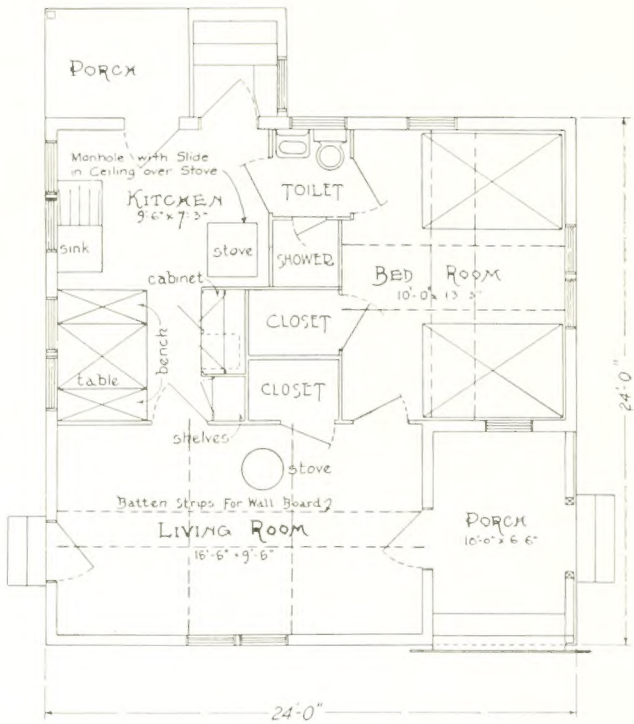


FIG. 13—PLAN OF NO. 1 COTTAGE

War gardens have been started at all the camps, planted by the District itself. They are cultivated by the occupants of the various cottages, the space set apart for the gardens, several acres in extent, being divided into plats about 30 by 100 feet in size, and a plat assigned to anyone who wishes to cultivate it, with the understanding that if he does not give his garden proper attention, it must be turned over to some one else. Garden plats are connected also with each of the cottages, but these are not expected to be under cultivation this year on account of the lateness of the season.

The messhalls, where many of the men are already eating, will accommodate about two hundred men at a meal. To provide for so many takes a fully equipped kitchen, furnished with the conveniences of a good modern hotel—bake oven; range; vegetable steamer; butcher's block; steam serving table, dish-washing machine and a small refrigerating plant.

In addition to the above there is in each camp the usual store, a first-aid cottage-hospital, a community hall, where public meetings and entertainments can be accommodated, and a school house for the children. As has been said, it is expected that all of these "camps" will become permanent villages, and the investment in these adjuncts to community life will not only prove to be of value during the work of construction, but afterwards as well.

SEEN AND HEARD ON THE JOB

Rupe's Iceless Refrigerator

There may well be times at the various camps this summer when ice is not available, or when the expense of buying it will look too great. To meet such cases, H. H. Rupe, the Superintendent of Carpenters at Englewood, has devised an inexpensive and novel form of iceless refrigerator. It is shown in the sketch figure 15.

Briefly, it is a very small circular cellar, made by sinking three twelve-inch drain pipes, one above the other, to a total depth of six feet in the earth. At this depth the ground is as cool as the inside of the ordinary refrigerator. In the vertical well thus formed a cylindrical tin bucket plays, fitted with three shelves. The food or water to be kept cool is placed on these shelves and let down. A rope passing vertically from the bucket bale to a small pulley fixed to the shed roof or bracket above, and thence over a second pulley to a counterweight, facilitates the operation.

The bucket is formed from a tin pipe eleven inches in diameter and three feet high, the shelves being of inch board, cut to circular form and fitted inside it. A sector of the pipe is cut out and hinged to form a door, which swings open horizontally, giving access to the shelves. The affair is easily made, and ought to be useful to many of the cottagers at the various camps during the present summer. If the demand proves sufficient, arrangement can be readily made with a local tinner to make the buckets in quantity, with accessories—rope, pulleys, etc.,—complete. The householder can easily dig the well and sink the drain pipes himself.

Fast Section Line Survey

The survey party under J. J. Heier, working on section lines near Huffman, recently unearthed nine old monuments in one day's work, including six section corners and two quarter section corners. This is the biggest "killing" in monuments that has yet come to our notice.

Remarkable First Aid Absolutely Without Parallel

George Pope, employed as carpenter helper at the Lockington Dam, had the misfortune to break his leg a few days ago. First aid was rendered by Mr. Downey, the blacksmith on the work, who in less than two hours had the injured party on his feet and back on the job.

The leg was an artificial one.

The leading feature of the Bulletin for September will be an illustrated article on the machinery and equipment to be used in the building of the dams, and the work of channel improvement. It will include an account of how this equipment was gathered together, this indeed being the most interesting part of the story.

The Miami Conservancy Bulletin is the regular medium through which the organization will reach the public. It hopes the public will be sufficiently interested to respond with questions and if need be with criticisms. Both are welcome and both will receive careful attention.

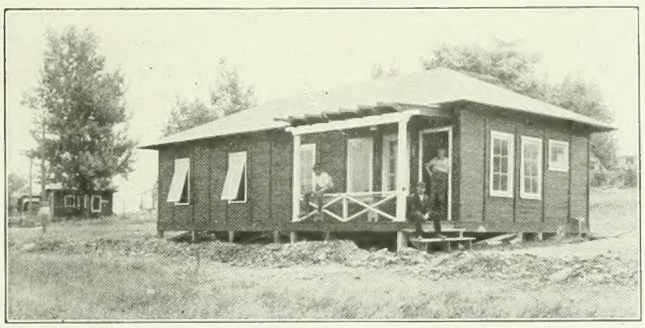


FIG. 14—A 12-MAN BUNKHOUSE AT HUFFMAN

A one story house 18 by 42 feet in size, accommodating 12 men.

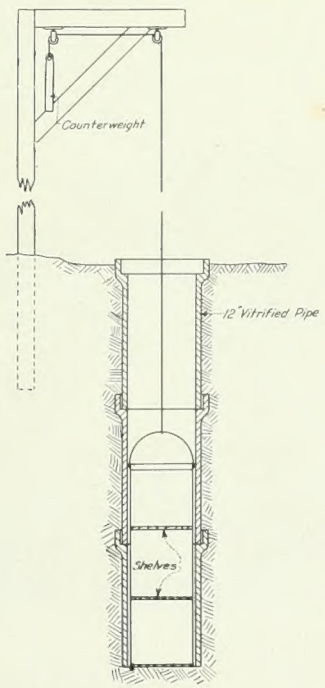


FIG. 15—RUPE'S ICELESS REFRIGERATOR

Moving Construction Railway Equipment to Germantown Damsite

At four of the damsites of the District there is either a steam or an electric railway running close to the work. At Germantown, however, no railway of either kind runs nearer than the village itself, some two and a half miles distant. At this point, the transportation to the work of the construction cars and locomotives, to be used in the building of the dams and related structures, presented a special problem, the equipment being standard gauge, and of considerable size and weight.

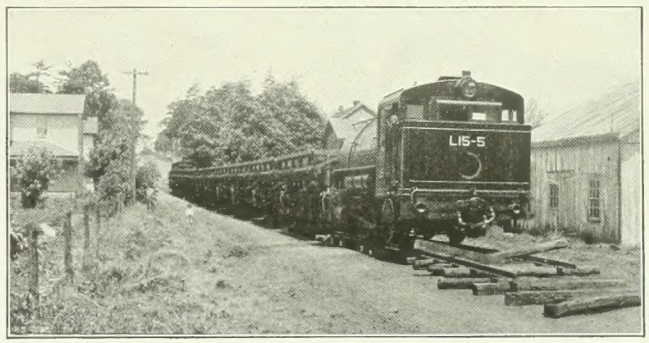


FIG. 16—MOVING A CONSTRUCTION TRAIN TO GERMANTOWN DAMSITE

The difficulty was solved by laying a track down the village street and along the country highway, and running the equipment to the dam as a train, under its own power. The distance was not covered of course at one run, but in short lengths, the rails being taken up behind the train and relaid in front as the journey proceeded.

Grades were encountered too steep for the entire train to climb, even when driven by both locomotives. To overcome this a siding had to be built at the top of the hill. The front locomotive dragged the cars up the slope one at a time, and stored them on this siding, where they were made up once more into a train and moved ahead again out onto the main line.

Trouble of a different sort may be encountered when the train comes to be let down a long, steep slope which occurs near the camp. If the train is allowed to stop for any length of time on the slope the water in the locomotive boilers will all run to the lower end, leaving the upper ends of the boiler tubes without water protection, exposed to the heat of the furnace. A bad case of burning might result.

Inch-worming along in the fashion described, pulling up track behind and laying it in front, is naturally pretty slow business. The trip from Germantown village began on June 28, and the train had covered about half the distance by July 8. The picture, figure 16, shows it standing on its section of track in a street in the edge of the village, with the hill which had to be negotiated a car at a time, showing ahead down the highway. The locomotives and cars have to travel about three miles and a half to cover a highway distance of two and a half miles.

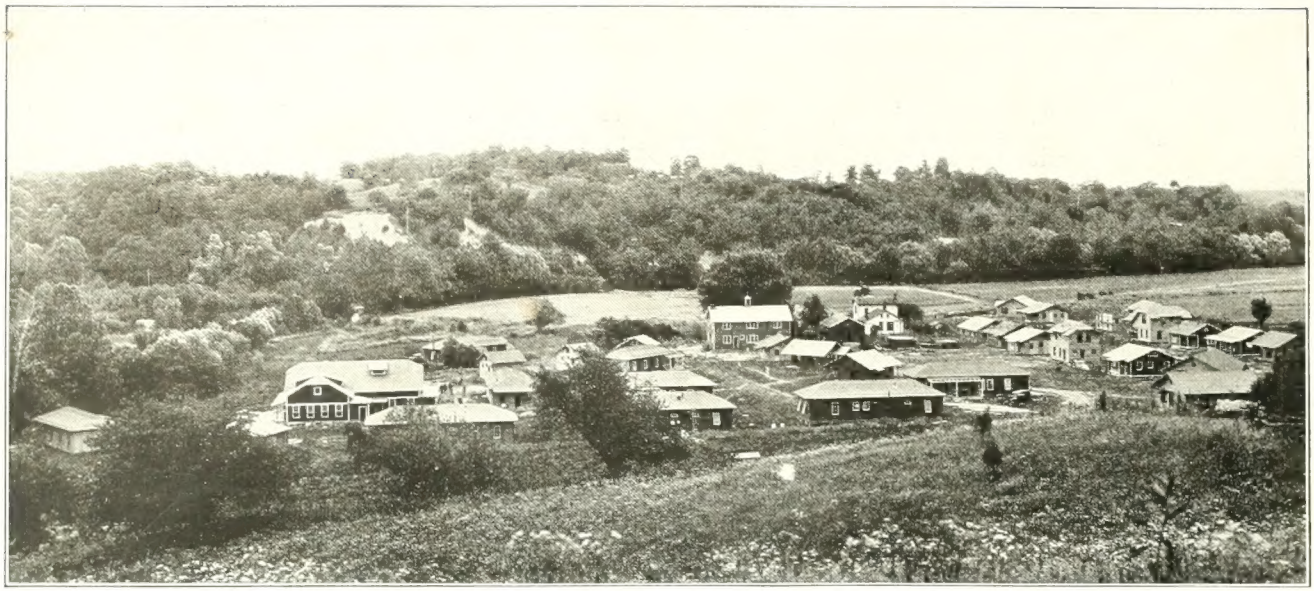


FIG. 17—THE CAMP AT GERMANTOWN

A general view looking a little south of east from the southern end of the dam site. The large building on the extreme left is the mess hall. The long, low buildings are bunkhouses, accommodating from eight to twenty-four men. The smaller buildings, grouped, most of them, at the right, are cottages for single families. The building with a cupola, formerly a barn, is the office. The dwelling to the right of it is the Division Engineer's residence. It was formerly a farm house. The barn this side of it has been turned into a shop. Twin Creek flows just to the left of the trees seen at the extreme left of the picture; then turns and runs to the right at the foot of the hill in the distance. It is hidden by the trees on the bank.

Railroad Relocation

The most conspicuous work at Huffman at the present stage of operations is that of railway relocation. The Big Four, the Erie, and the Ohio Electric, at the west end of the damsite here, must be moved back into the hill to make room for the dam, necessitating a cut of about a hundred feet. On this work, and on the B. & O. relocation for the Taylorsville basin, at various points, there are at present engaged some 9 steam shovels, 8 locomotives, 46 cars, 100 teams and 560 men. A fuller account of the relocation work will appear in the next issue of the Bulletin.

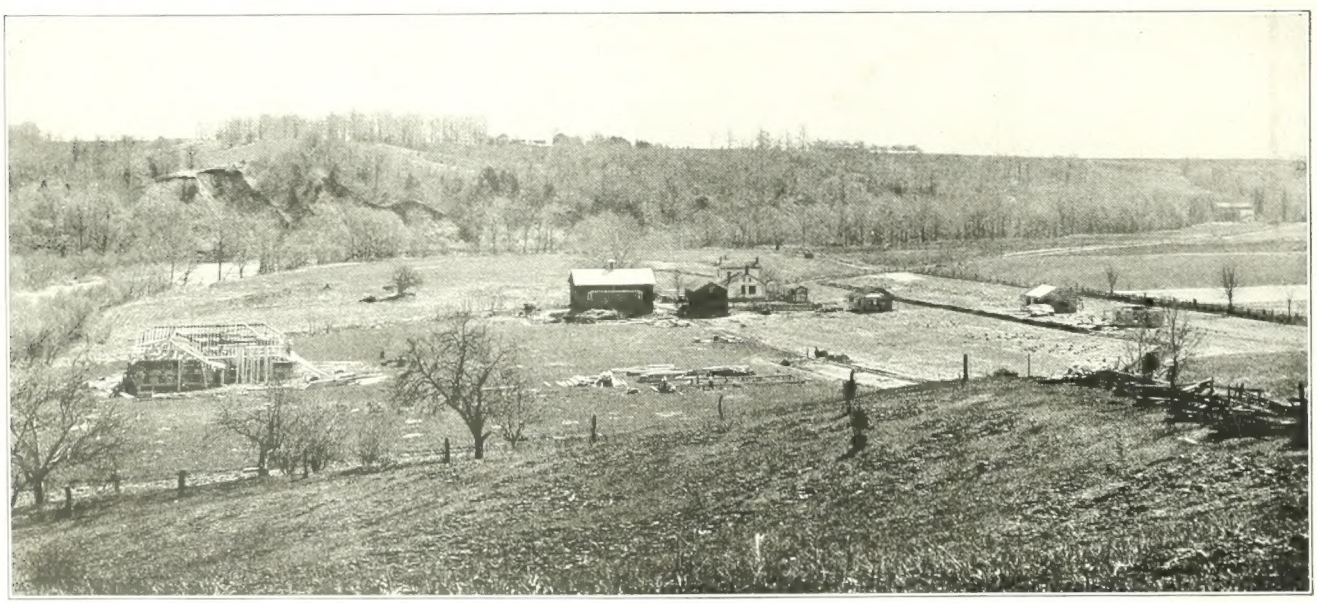


FIG. 18—THE CAMP AT GERMANTOWN

Takes April 18, 1918, two months earlier than the above view, and from the same point, showing it as it appeared in the beginning. The large barn is now the Division Engineer's office. The frame of the big mess hall is seen at the left, with siding partly on. View from south end of proposed dam.